Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-3 (Cancelled).

Claim 4 (Currently amended). ~~The method of claim 1,~~ A method of maintaining a multidimensional histogram for a data array having a data array size, the method having a processing time substantially less than proportional to the data array size, the method comprising:

receiving a data update that indicates a change to data in the data array;

with the data update, updating an intermediate data structure having a size substantially smaller than the data array size, so that the updated intermediate data structure remains an at-least-approximate representation of the data in the data array as changed by the data update;

collecting a number of substantially-largest-coefficient linear combinations of then-current data, the number being small compared with the data array size; and

forming the multidimensional histogram as a histogram to an intermediate data array re-synthesized from the collected linear combinations; wherein the intermediate data structure constitutes a histogram sketch of the data that includes one or both of:

an identification sketch of linear combinations of the data, the identification sketch being configured to identify, with imited error, linear combinations whose coefficients are large; and

a count sketch of linear combinations of data, the count sketch being configured to approximate the coefficients of linear combinations.

Claim 5 (Cancelled).

Claim 6 (Currently amended). ~~The method of Claim 1, further comprising:~~ A method of maintaining a multidimensional histogram for a data array having a data array size, the method having a processing time substantially less than proportional to the data array size, the method comprising:

receiving a data update that indicates a change to data in the data array;

with the data update, updating an intermediate data structure having a size substantially smaller than the data array size, so that the updated intermediate data structure remains an at-least-approximate representation of the data in the data array as changed by the data update;

collecting a number of substantially-largest-coefficient linear combinations of then-current data, the number being small compared with the data array size;

forming the multidimensional histogram as a histogram to an intermediate data array re-synthesized from the collected linear combinations; and

reducing the collection of linear combinations before forming the multidimensional histogram, by discarding a linear combination according to a criterion belonging to a group of criteria including:

a) a square of a largest coefficient of a discarded linear combination is small compared with a sum of squares of coefficients of all discarded linear combinations;

b) a square of a largest coefficient of a discarded linear combination is small compared with a sum of squares of a difference between a then-current data and an array represented by a collection of retained linear combinations; and

c) a square of a largest coefficient of a discarded linear combination is small compared with a sum of squares of a difference between a then-current data and an array represented by a collection of retained linear combinations, the sum of squares being approximated using a sum-of-squares sketch.

7 (Currently amended). ~~The method of Claim 1,~~ A method of maintaining a multidimensional histogram for a data array having a data array size, the method having a processing time substantially less than proportional to the data array size, the method comprising:

receiving a data update that indicates a change to data in the data array;

with the data update, and updating an intermediate data structure having a size substantially smaller than the data array size, so that the updated intermediate data structure remains an at-least-approximate representation of the data in the data array as changed by the data update;

collecting a number of substantially-largest-coefficient linear combinations of then-current data, the number being small compared with the data array size; and

forming the multidimensional histogram as a histogram to an intermediate data array re-synthesized from the collected linear combinations;

wherein the step of updating the intermediate data structure includes [[:]] combining plural pre-intermediate data structures, each of which may not itself be a faithful representation of the data in the data array.

Claim 8 (Original). A method of preparing a multidimensional histogram for a data array, the data array characterized by a data array size and including data, the method having an execution time proportional to the data array size and using an amount of storage space substantially smaller than the data array size, the method comprising:

receiving data from the data array;

transforming the data into linear combinations of data items, or of approximations of the linear combinations of data items;

collecting a moderate number of substantially-largest-coefficient linear combinations of the data; and

forming the multidimensional histogram as a histogram to the collected linear combinations.

Claim 9 (Original). The method of Claim 8, wherein the data receiving step includes:

reading the data in a reading sequence such that at least some of the data that is close together in the reading sequence is close together in a multidimensional grid, so as to facilitate the transforming step.

Claim 10 (Original). The method of claim 8, wherein:

the linear combinations are tensor products of Haar wavelets (TPHWs) of data in the data array.

Claim 11 (Original). The method of Claim 8, further comprising:

reducing the collection of linear combinations before forming the multidimensional histogram, by discarding a linear combination according to a criterion belonging to a group of criteria including:

a) a square of a largest coefficient of a discarded linear combination is small compared with a sum of squares of coefficients of all discarded linear combinations;

b) a square of a largest coefficient of a discarded linear combination is small compared with a sum of squares of a difference between a then-current data and a array represented by a collection of retained linear combinations; and

c) a square of a largest coefficient of a discarded linear combination is small compared with a sum of squares of a difference between a then-current data and an array represented by a collection of retained linear combinations, the sum of squares being approximated using a sum-of-squares sketch.

Claim 12-20 (Cancelled).